



Reference: 092057

February 3, 2005

**Ms. Bonnie Rolandelli
California Regional Water Quality Control Board, North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, CA 95403**

Subject: Work Plan for Additional Site Investigation, Branscomb Store, Branscomb, California; Case No. ITMC214

Introduction

SHN Consulting Engineers & Geologists, Inc. (SHN) has provided this work plan for additional site investigation at the Branscomb Store site, which is located at 1 Main Street in the City of Branscomb, California (Figure 1). The Regional Water Quality Control Board (RWQCB) requested this work plan in a letter dated November 4, 2004.

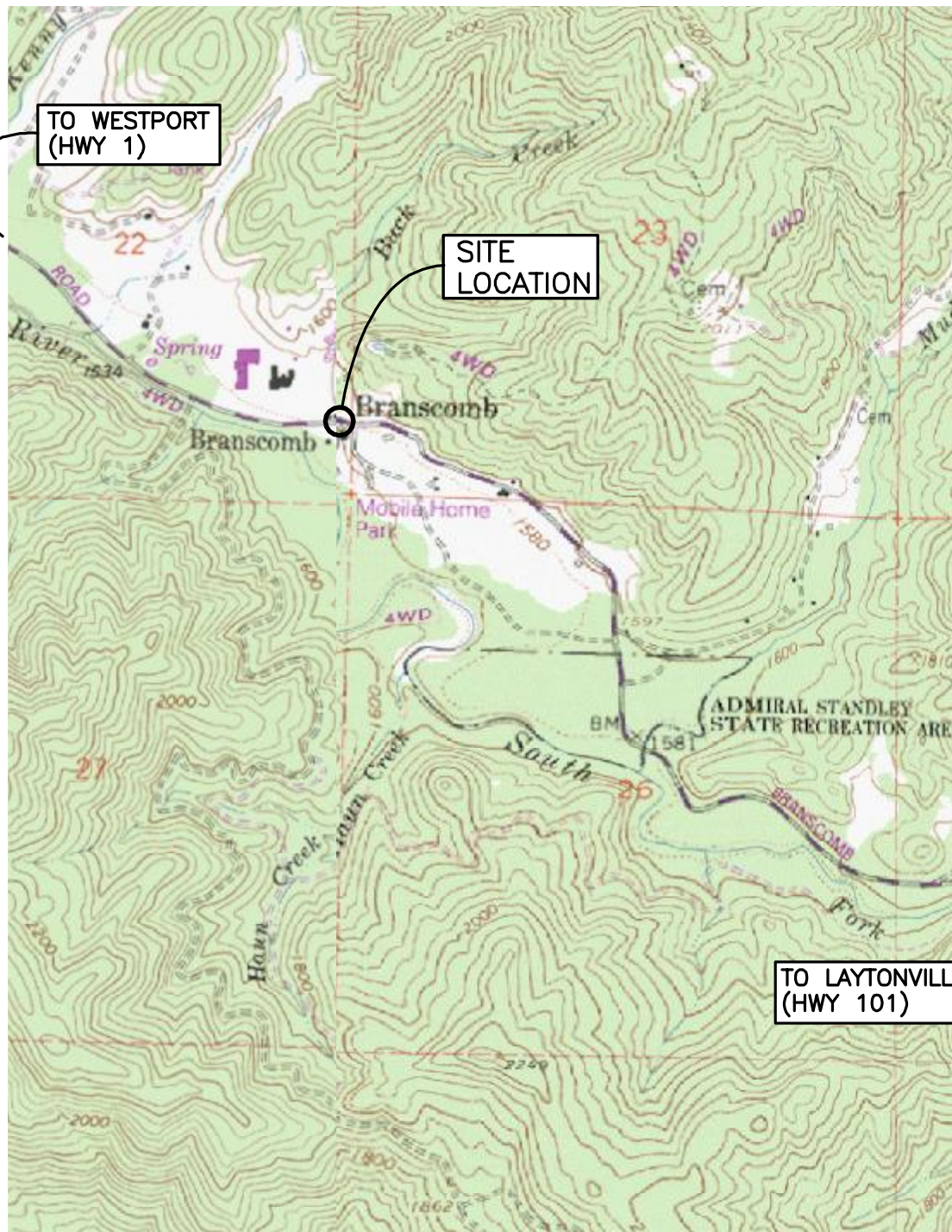
Background

The Branscomb Store contains an active retail fuel station that operates with an Aboveground Storage Tank (AST) system. Two 1,000-gallon gasoline Underground Storage Tanks (USTs), and one 500-gallon gasoline UST, were previously operated at the site from the late 1950s until 1990. In October 1991, the three USTs were removed from the site. A representative from the Mendocino County Department of Environmental Health (MCDEH) was present during the tank removals, and completed an "Underground Hazardous Materials Storage Tank Abandonment Inspection Report." According to the MCDEH report, the former tanks were of single-walled steel construction, and all contained small holes. Approximately 50 cubic yards of soil were excavated during the tank removal activities.

During the UST removals, a series of soil samples was collected from the former tank locations. The soil samples were analyzed for Total Petroleum Hydrocarbons as Gasoline (TPHG); Benzene, Toluene, Ethylbenzene, and total Xylenes (BTEX); and total lead. Laboratory analyses of the soil samples that were collected revealed the presence of petroleum hydrocarbons.

SHN conducted a limited subsurface investigation at the site in April 1997. Five temporary well points were installed and sampled to assess groundwater conditions in the area of the former USTs. Information collected during this investigation revealed that groundwater at the Branscomb Store site had been impacted by petroleum hydrocarbons. However, the extent of petroleum hydrocarbon-impacted groundwater appeared to be limited to the immediate area around the former UST locations.

In January 2000, SHN supervised the installation of four groundwater monitoring wells (MW-1 through MW-4) at the site, as approved by the RWQCB on February 11, 1998. The monitoring well locations were chosen based on the results of the limited subsurface investigation conducted by SHN in April 1997 (SHN, 2000).



MAP REFERENCE:
USGS QUADRANGLES OF
CAHTO PEAK AND LINCOLN
RIDGE



Quarterly monitoring was initiated at the Branscomb Store site on February 22, 2000, as required by the RWQCB. Groundwater monitoring occurred at the site for one year, and was not conducted for the following three years. On August 13, 2004, quarterly groundwater monitoring was resumed at the site. Historic groundwater analytical data is included in Attachment 1.

Objective

The objective of this site investigation is to further assess soil and groundwater conditions downgradient of the former UST locations. Of particular interest is the area downgradient of well MW-2. TPHG has consistently been detected in this well. The direction of groundwater flow at the site has historically been in a west to northwestward direction.

Scope of Work

The scope of work presented below is designated to provide the information needed to meet the objective of this investigation.

- Implement project, including permitting with regulatory agencies and coordination with a drilling subcontractor.
- Drill and sample one exploratory soil boring.
- Convert the soil boring into a groundwater monitoring well.
- Coordinate laboratory analyses of the soil samples.
- Survey the groundwater monitoring well for location and elevation.
- Prepare a report of findings.

Field Activities

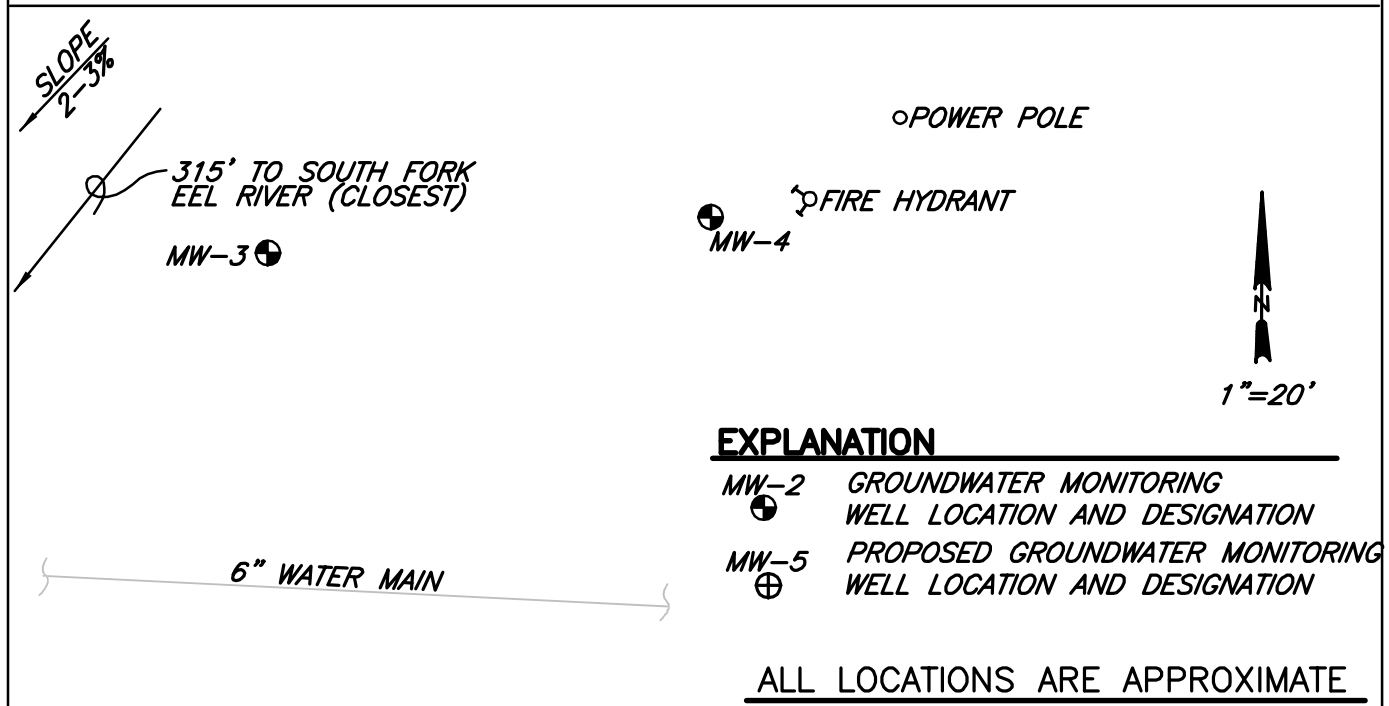
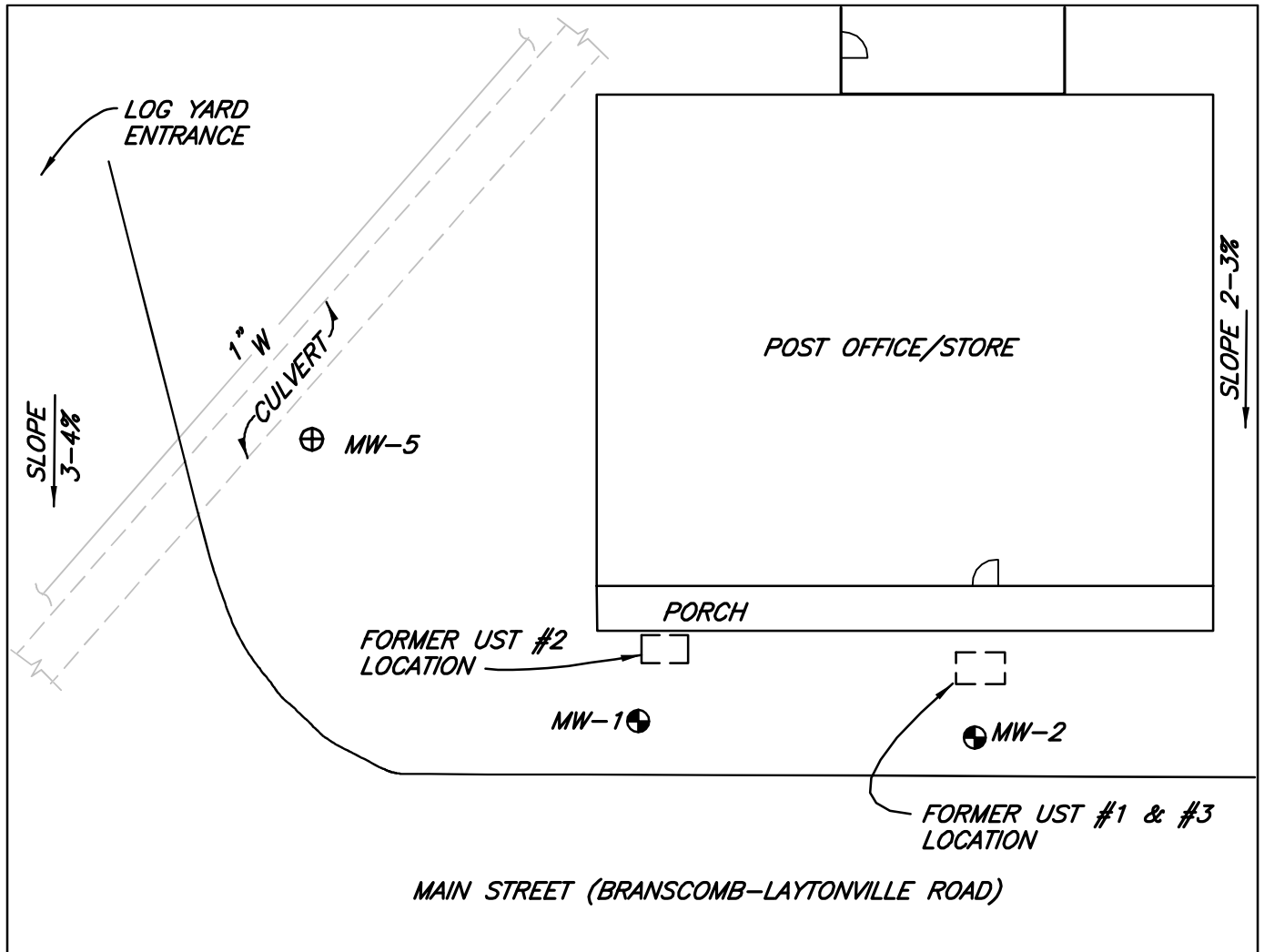
Soil Boring

One exploratory soil boring (MW-5) is proposed to be drilled at the site using a truck-mounted hollow stem auger drill rig. The proposed soil boring location is shown on Figure 2. Soil samples will be collected from the exploratory boring at approximate five-foot intervals, changes in lithology, and above the water table, for lithologic interpretation and possible chemical analysis. The soil samples will be screened in the field for the presence of petroleum utilizing an Organic Vapor Analyzer (OVA).

The soil samples will be labeled with the location, depth, date and time of collection, analyses, requested, and the sampler's initials. All of the soil samples will be placed into an iced cooler and transported under chain-of-custody documentation to a State of California-certified analytical laboratory for chemical analyses. Up to two soil samples will be selected by the project manager to be analyzed for the constituents presented in the Laboratory Analysis section of this document.

Monitoring Well Installation and Development

A groundwater-monitoring well will be constructed in soil boring MW-5. The monitoring well will be constructed using 2-inch interior diameter, Polyvinyl Chloride (PVC) casing, and Schedule 40 PVC well screen with 0.010-inch well slots. The well is proposed to be screened from



approximately 5 to 15 feet Below Ground Surface (BGS). The filter pack for the well will consist of 2/12 Monterey sand. Bentonite chips will be used for the sanitary seal, and the remainder of the annulus will be filled with neat cement. A flush mount Christy box will be set in concrete to protect the wellhead. The wellhead will be secured with a locking cap. A well construction detail is included in Attachment 2.

After installation, the groundwater-monitoring well will be developed using surge and purge techniques. Prior to development, the monitoring well will be measured for depth to water and checked for the presence of floating product. During development, the well will be monitored for Electrical Conductivity (EC), temperature, and pH, utilizing portable instrumentation.

The groundwater-monitoring well will be surveyed for location and elevation under the direction of a California-licensed surveyor. The monitoring well (top of casing) elevation will be referenced to National Geodetic Vertical Datum (NGVD) 29, to the nearest 0.01 foot.

Equipment Decontamination Procedures

All soil boring and monitoring well installation equipment will be cleaned prior to being transported to the Branscomb Store site. All drilling equipment will be cleaned utilizing a portable steam cleaner. All other equipment that required on-site cleaning will be initially washed in a water solution containing Liquinox® cleaner, followed by a distilled water rinse, then by a second distilled water rinse.

Investigation-Derived Waste Management

All soil generated during the soil boring and monitoring well installation will be temporarily stored on site in Department of Transportation (DOT)-approved DOT 17 E/H, 55-gallon drums. The contents of the drums will be sampled, and then properly disposed of, based on the laboratory analytical results. All water that is utilized for decontaminating field equipment, tools, and monitoring well purge water, will be contained in approved DOT drums. The water will then be transported to SHN's purge water storage tank located at 812 West Wabash Avenue in Eureka, California. The water will subsequently be discharged, under permit, to the City of Eureka wastewater collection system.

Laboratory Analysis

Each soil sample collected from the exploratory boring will be analyzed for:

- TPHG and BTEX, in general accordance with U.S. Environmental Protection Agency (EPA) Method No. 8260B.
- Fuel oxygenates Methyl Tertiary-Butyl Ether (MTBE), Tertiary-Butyl Alcohol (TBA), Tertiary-Amyl Methyl Ether (TAME), Diisopropyl Ether (DIPE), and Ethyl Tertiary-Butyl Ether (ETBE), in general accordance with EPA Method No. 8260B.

North Coast Laboratories, Ltd., a State-certified analytical laboratory located in Arcata, California, will conduct all sample analyses.

Data Evaluation and Report Preparation

Following the completion of the field work and laboratory analyses, a report of findings will be prepared presenting the results of the site investigation. SHN anticipates that the soil sample analyses will take approximately two weeks from the time of submittal to the laboratory following the fieldwork. The report of findings will be prepared and submitted to the HCDEH within approximately six weeks following receipt of the laboratory analytical data. The report will contain a description of field activities performed during the investigation, a discussion of the results, and recommendations for further activities, if necessary.

Sensitive Receptor Survey

SHN completed a Sensitive Receptor Survey utilizing a 1,000-foot radius from the Branscomb Store site (Figure 3-1, Attachment 3). The purpose of the sensitive receptor survey was to identify any potential sensitive receptors that could be impacted or threatened by existing groundwater contamination at the site. Data for this survey was acquired from the State of California, Department of Water Resources (DWR), the State Water Resource Control Board on-line Geotracker database, the RWQCB, and the United States Geological Survey (USGS) 7.5 Minute Series *Cahto Peak and Lincoln Ridge, California*, topographic maps.

DWR representative, Ann Ross informed SHN during a December 14, 2004, telephone consultation that there are four registered wells located within Township 21 North, Range 16 West, Sections 22, 23, 26, and 27, Mount Diablo Base & Meridian, where the 1,000-foot radius study area from the subject property is located. These wells are listed in Table 1. All four of these wells are identified as domestic wells. No street addresses or locations for these four wells were provided by the DWR. The DWR requires a written directive to release additional information, including locations, for each of these wells.

Table 1 DWR-Registered Water Wells Located Within a 1,000-Foot Radius Branscomb Store, Branscomb, California		
Well Identification ¹	Section Location ¹	Well Type ¹
21N/16W-22	22	Domestic
21N/16W-22	22	Domestic
21N/16W-26	26	Domestic
21N/16W-26	26	Domestic
1. Data provided by the State of California, Department of Water Resources		

SHN reviewed the USGS 7-1/2 Minute Series Cahto Peak and Lincoln Ridge, California topographic maps, to identify any stream courses, surface water bodies, or other environmentally sensitive areas located within the 1,000-foot search radius (Figure 1). Buck Creek is located approximately 600 feet north and topographically upslope from the Branscomb Store site. A pond or similar surface water feature is mapped approximately 800 feet northeast and upslope from the Branscomb Store site. Given their upslope locations, and considering that the direction of groundwater flow beneath the Branscomb Store site is to the west/northwest, it is reasonable to assume that neither Buck Creek nor the pond are likely to be sensitive receptors that could be impacted by contaminated groundwater from the Branscomb Store site.

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The South Fork of the Eel River is located approximately 400 feet southwest and hydraulically cross-gradient from the Branscomb Store site. Given its distance away, and cross-gradient location relative to the known direction of groundwater flow beneath the Branscomb Store site, it is unlikely that the Eel River will be a potential sensitive receptor that could be impacted by contaminated groundwater from the site. The direction of groundwater flow is toward the Harwood Mill. The mill property to the immediate northwest of the former UST locations has been used as a log deck area, with the mill structures to the northwest of that.

A buried utility survey was performed in the area surrounding the Branscomb Store site, again utilizing a 1,000-foot search radius. The Harwood Water System supplies potable water to the Branscomb Store and other residential and commercial properties located within the designated search radius. A one-inch diameter water service pipeline is located approximately 50 feet west of the former UST locations. The existing pipeline is located approximately one-foot BGS. An underground drainage culvert is also located on the western portion of the site, and is approximately two feet BGS. A six-inch diameter buried water distribution pipeline associated with the Harwood Water System is located south of the Branscomb Store site, along the opposite side of Main Street (Figure 2). The depth of this pipeline is approximately three feet BGS.

A review of the depth to groundwater data for the Branscomb Store site that was collected during the fourth quarter 2004, monitoring event indicates that the groundwater beneath the site ranges from approximately six to eight feet BGS. As such, it is unlikely that any of the existing underground utilities located on and near the subject property would act as preferential pathways for existing groundwater contamination at the site.

No immediate, potential health and safety issues were observed within the 1,000-foot search radius from the Branscomb Store site.

SHN proposes to implement the work plan upon receipt of approval form the RWQCB. Once monitoring well MW-5 is installed and developed, it will be added to the ongoing quarterly monitoring program and sampled during the next regularly scheduled sampling event.

If you have any questions regarding this work plan or the sensitive receptor survey, please call me at (707) 441-8855.

Sincerely

SHN Consulting Engineers & Geologists, Inc.



Frans B. Lowman, R.G.
Project Manager

FBL/SLD:lms

Attachments: 1. Historic Data
2. Monitoring Well Construction Details
3. 1,000-Foot Radius Map

copy w/attach: Mr. Michael Patrick, Harwood Products



Table 1-1
Historic Groundwater Elevations
Branscomb Store, Branscomb, California

Sample Location	Sample Date	Top of Casing Elevation (feet MSL) ¹	Depth to Water (feet) ²	Groundwater Elevation (feet MSL)
MW-1	2/22/00	1,529.31	7.74	1,521.57
	5/16/00		8.66	1,520.65
	10/27/00		9.00	1,520.31
	1/2/01		8.63	1,520.68
	8/13/04		8.98	1,520.33
	11/8/04		8.73	1,520.58
MW-2	2/22/00	1,529.67	8.13	1,521.54
	5/16/00		8.42	1,521.25
	10/27/00		9.00	1,520.67
	1/2/01		8.52	1,521.15
	8/13/04		8.90	1,520.77
	11/8/04		8.63	1,521.04
MW-3	2/22/00	1,526.61	5.92	1,520.69
	5/16/00		6.34	1,520.27
	10/27/00		6.55	1,520.06
	1/2/01		6.32	1,520.29
	8/13/04		6.51	1,520.10
	11/8/04		6.34	1,520.27
MW-4	2/22/00	1,528.32	6.98	1,521.34
	5/16/00		7.40	1,520.92
	10/27/00		7.69	1,520.63
	1/2/01		7.43	1,520.89
	8/13/04		7.69	1,520.63
	11/8/04		7.41	1,520.91
1. MSL: Mean Sea Level 2. Below top of casing				

Table 1-2
Historic Groundwater Analytical Results
Branscomb Store, Branscomb, California
(in ug/L)¹

Sample Location	Date	TPHG²	BTEX³	MTBE⁴	TBA⁴	DIPE⁴	ETBE⁴	TAME⁴
MW-1	2/22/00	170	1.1	<3.0⁵	NA⁶	NA	NA	NA
	5/16/00	<50	<0.50	<0.50	<10	<1.0	<1.0	<1.0
	10/27/00	<50	<0.50	<0.50	<10	<1.0	<1.0	<1.0
	1/2/01	<50	<0.50	<3.0	NA	NA	NA	NA
	8/13/04	<50	<0.50	<1.0	<10	<1.0	<1.0	<1.0
	11/8/04	<50	<0.50	<1.0	<10	<1.0	<1.0	<1.0
MW-2	2/22/00	2,400	<4.0	3.0	NA	NA	NA	NA
	5/16/00	1,500	<0.50	2.2	<10	<1.0	<1.0	<1.0
	10/27/00	240	<0.50	2.9	<10	<1.0	<1.0	<1.0
	1/2/01	820	<0.50	3.2	NA	NA	NA	NA
	8/13/04	400	<0.50	<1.0	<10	<1.0	<1.0	<1.0
	11/8/04	330	<0.50	<1.0	<10	<1.0	<1.0	<1.0
MW-3	2/22/00	<50	<0.50	4.5	NA	NA	NA	NA
	5/16/00	<50	<0.50	<0.50	<10	<1.0	<1.0	<1.0
	10/27/00	<50	<0.50	<0.50	<10	<1.0	<1.0	<1.0
	1/2/01	<50	<0.50	<3.0	NA	NA	NA	NA
	8/13/04	<50	<0.50	<1.0	<10	<1.0	<1.0	<1.0
	11/8/04	<50	<0.50	<1.0	<10	<1.0	<1.0	<1.0
MW-4	2/22/00	<50	<0.50	5.3	NA	NA	NA	NA
	5/16/00	<50	<0.50	<0.50	<10	<1.0	<1.0	<1.0
	10/27/00	<50	<0.50	<0.50	<10	<1.0	<1.0	<1.0
	1/2/01	<50	<0.50	<3.0	NA	NA	NA	NA
	8/13/04	<50	<0.50	<1.0	<10	<1.0	<1.0	<1.0
	11/8/04	<50	<0.50	<1.0	<10	<1.0	<1.0	<1.0

1. ug/L: micrograms per Liter

2. TPHG: Total Petroleum Hydrocarbons as Gasoline analyzed using EPA Method No. 8260B.

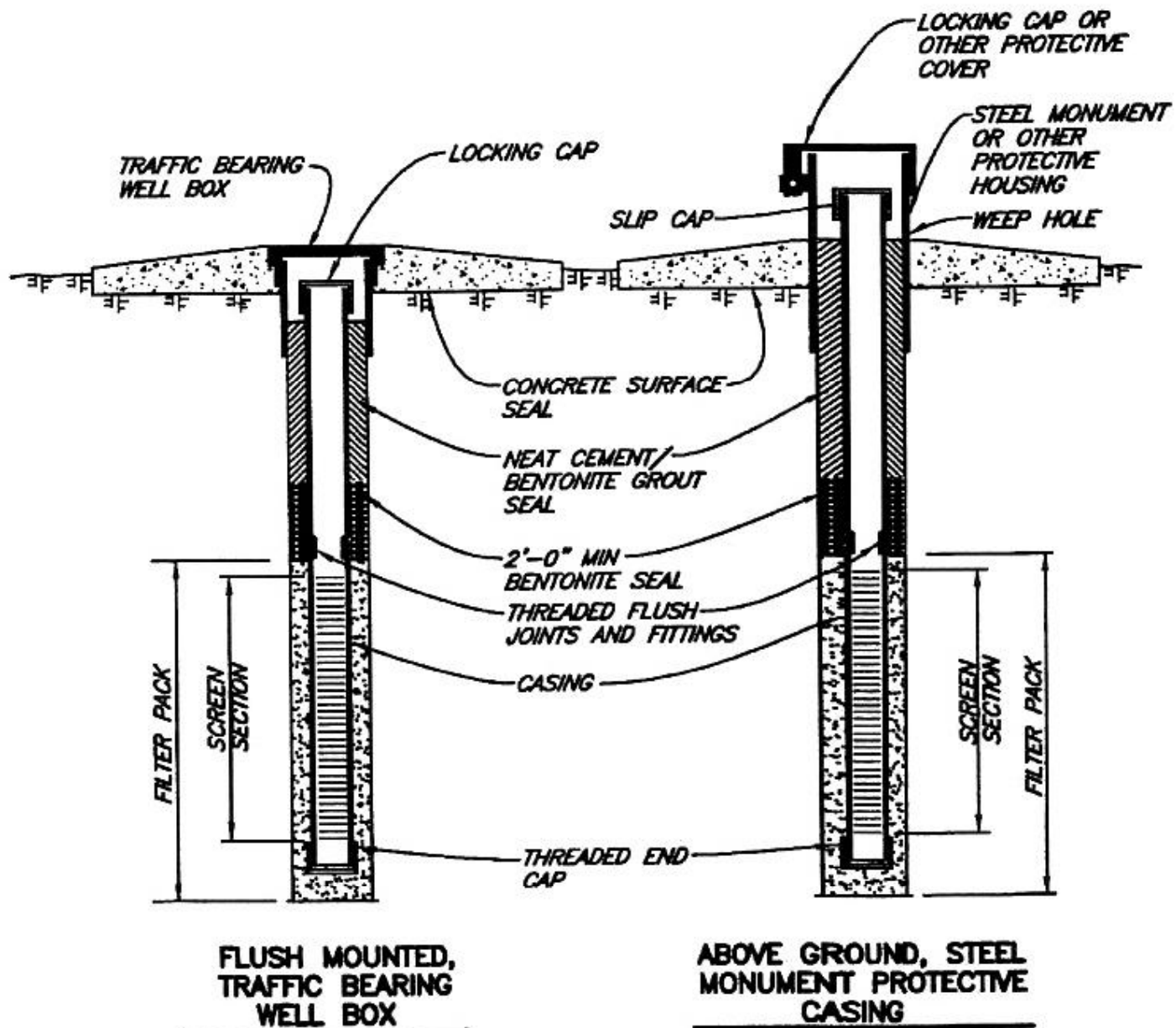
3. Benzene (B), Toluene (T), Ethylbenzene (E), and total Xylenes (X) analyzed in accordance with EPA Method No. 8260B.

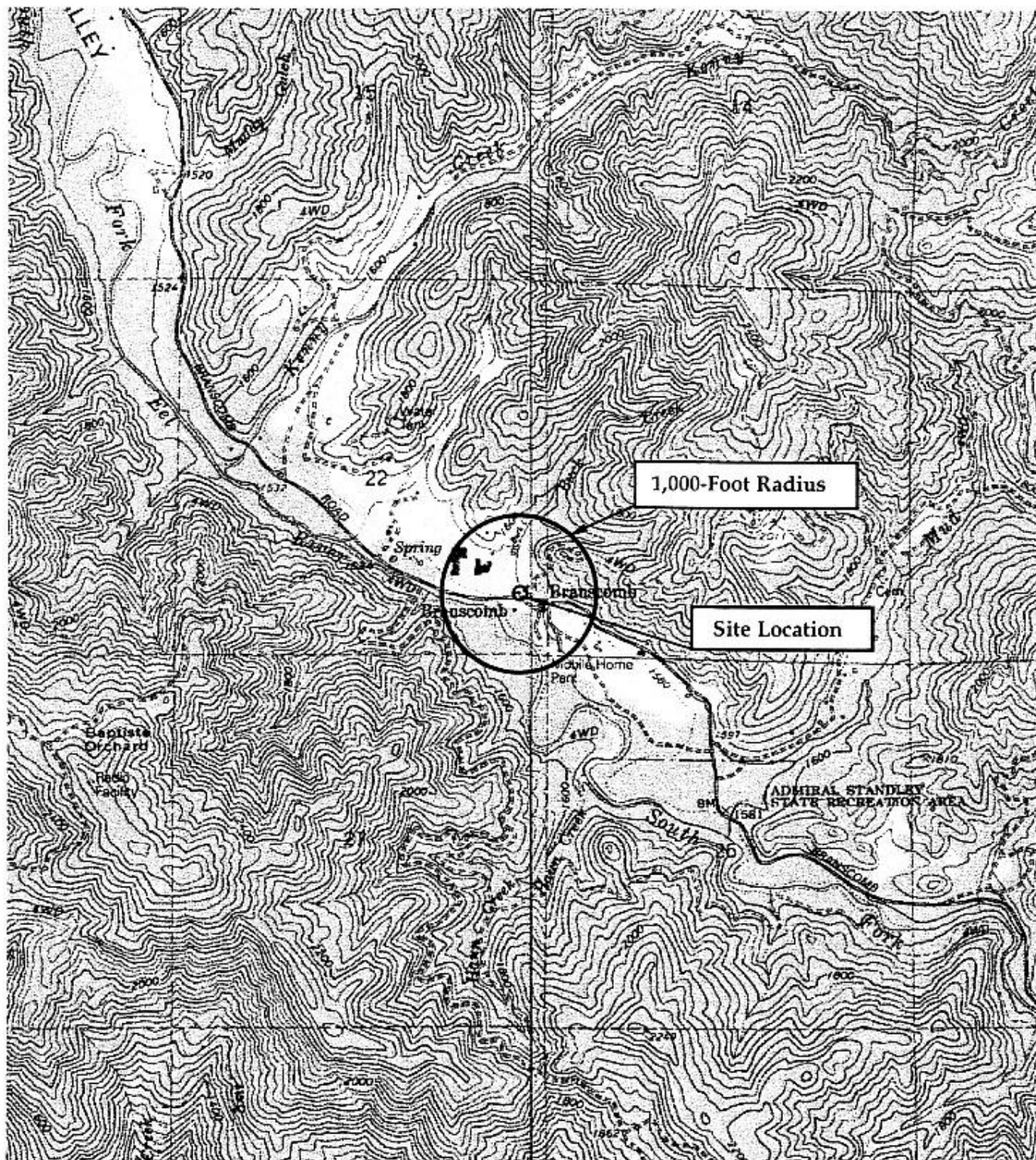
4. Fuel Oxygenates: MTBE (Methyl Tertiary-Butyl Ether), TBA (Tertiary-Butyl Alcohol), TAME (Tertiary-Amyl Methyl Ether), DIPE (Diisopropyl Ether), and ETBE (Ethyl Tertiary-Butyl Ether), analyzed in general accordance with EPA Method No. 8260B.

5. <: denotes a value that is "less than" the method detection limit.

6. NA: Not Analyzed

Table 1-3 Historic DO, DCO₂, and ORP Measurement Results Branscomb Store, Branscomb, California				
Sample Location	Sample Date	DO¹ (ppm)²	DCO₂³ (ppm)	ORP⁴ (mV)⁵
MW-1	5/16/00	0.80	40	235
	10/27/00	0.57	60	135
	1/2/01	0.63	30	98
	8/13/04	0.56	80	56
	11/8/04	0.90	40	125
MW-2	5/16/00	0.49	50	-30
	10/27/00	0.50	70	-35
	1/2/01	0.58	70	82
	8/13/04	0.55	120	-102
	11/8/04	0.80	90	-20
MW-3	5/16/00	0.58	20	140
	10/27/00	0.59	20	125
	1/2/01	1.68	30	83
	8/13/04	0.54	25	22
	11/8/04	1.43	30	109
MW-4	5/16/00	0.53	20	175
	10/27/00	0.56	20	110
	1/2/01	2.54	20	65
	8/13/04	0.59	20	53
	11/8/04	1.34	20	108
1. DO: Dissolved Oxygen, field measured using portable instrumentation. 2. ppm: parts per million. 3. DCO ₂ : Dissolved Carbon Dioxide, field measured using a field test kit. 4. ORP: Oxidation-Reduction Potential measured using portable instrumentation. 5. mV: millivolts				





MAP REFERENCE:
USGS QUADRANGLES OF
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Branscomb Store
Branscomb, California

1,000-Foot Radius Map
SHN 920057

January 2005

Figure 3-1